

WE CLAIM:

1. A method for determining the endpoint of a chemical mechanical polish process, comprising:

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providing a semiconductor wafer with a polish surface;

mounting said wafer adjacent a reference surface;

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polishing said polish surface using a chemical mechanical polishing process;

exposing said polish surface and said reference surface to a light source;

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measuring a signal S_x from said polish surface;

measuring a signal S_B from said reference surface;

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deriving a signal S_{tx} given by $S_{tx} = f(S_x, S_B)$; and

determining an endpoint of said chemical mechanical polishing process when the derived signal S_{tx} equals a predetermined level.

2. The method of claim 1 wherein said signal S_x is measured
at a various times.

3. The method of claim 2 wherein said signal S_x is a maximum
5 signal obtained.

4. The method of claim 2 wherein said signal S_x is an
average signal obtained between a plurality of position
points.

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5. The method of claim 1 wherein said derived signal is a
difference between S_x and S_B .

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6. An endpoint method for chemical mechanical polishing,
comprising:

5 providing a semiconductor wafer with a polish surface;

mounting said wafer adjacent a reference surface;

10 polishing said polish surface using a chemical
mechanical polishing process;

15 exposing said polish surface and said reference
surface to a light source;

measuring a signal S_x from said polish surface;

15 measuring a signal S_B from said reference surface;

20 deriving a signal S_{tx} given by $S_{tx} = f(S_x, S_B)$ wherein said
derived signal S_{tx} is a difference between S_x and S_B ; and

determining an endpoint of said chemical mechanical
polishing process when the derived signal S_{tx} equals a
predetermined level.

7. The method of claim 6 wherein said signal S_x is measured at a various times.

8. The method of claim 7 wherein said signal S_x is a maximum
5 signal obtained.

9. The method of claim 7 wherein said signal S_x is an average signal obtained between a plurality of position points.

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10. A chemical mechanical polishing apparatus, comprising;

a platform with a first optical window;

5 a polishing pad with a second optical window affixed
to said platform wherein said first optical window is
aligned with said second optical window;

a wafer holder positioned above said polishing pad for
10 holding a semiconductor wafer in a first position;

a reference surface positioned adjacent to said first
position of said semiconductor wafer;

15 a light source positioned beneath said first and
second optical windows;

a detector positioned beneath said first and second
optical windows to detect reflected light from a polish
20 surface of a semiconductor wafer positioned on said wafer
holder and said reference surface; and

an electronic system connected to said detector for
determining a signal that is a function of said reflected

light from said polishing surface and said reference surface.

11. The chemical mechanical polishing apparatus of claim 10
5 wherein said electronic system determines a signal that is a difference of said reflected light from said polish surface and reflected light from said reference surface.

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